ICI MAGAZINE

PRICE TWOPENCE

MARCH 1958

THE I.C.I. MAGAZINE
VOLUME 36 NUMBER 257 MARCH 1958

The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1. Phone: VICtoria 4444. The editor is glad to consider articles for publication, and payment will be made for those accepted.

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FRONT COVER: *"Mountain Rescue," by S. Brickman (Plastics Division)*

OUR CONTRIBUTORS

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Australia and Ourselves

By John Clark

I.C.I.'s Associated company in Australia, with 6500 employees and a turnover of £A.37 million, is one of the enterprises which are helping to change what was primarily an agricultural country into a highly industrialised one.

Most readers are familiar with Australia's formidable record in sport: undisputed first in tennis, probably equal first in cricket, providing the Open Golf Champion three years in the last four; playing four codes of football, respected and feared when they visit us to play Rugby (Union or League); outstanding in rowing, swimming, athletics; 13 gold medals in the last Olympiad. Others will know of Australians who have made great names in other fields; Menzies, Bruce (finance), Baillieu (business), Gilbert Murray (classics), Florey (science), Helpmann (ballet), Melba, Joyce and Hammond (music), and many others.

A wonderful record of achievement for a population of 9½ million. You must wonder what kind of land produces a people like this. A vast land it is, basking most of the time in the sunshine we dream of having for a few weeks in the summer. Space in plenty—3,000,000 square miles. An easy way to picture the distances involved is to remember that an aircraft flying 12,000 miles from London to Sydney covers one-sixth of that distance (about 2000 miles) *inside* Australia. This is as far as from London to Cyprus.

Where do these people live? Mostly in the six capital cities. Fine cities with tall buildings and good shops and all the amenities of a high standard of living. Only 27½% of the population lives in rural districts. Yet half the area of the continent, 1,500,000 square miles, is used for some form of rural enterprise. This means long lines of communication, expensive roads and railways, and above all air transport to provide contact and services in the lonely outback. It means special arrangements such as education by radio, and, best known of all, the famous "Flying Doctor" service for the comfort and relief of the sick.

Many people think of Australia in terms of the wide open spaces—a land full of sheep. It is true that the wool clip, 1,400,000,000 lb. a year, provides the greatest contribution to Australia's income from exports. (Compare this with our current target for 'Terylene' output—50,000,000 lb. a year.) The wool clip sold last year for £A.485,000,000, but Australia for its population size is a highly industrialised country supporting 50,000 factories with a total output of £A.3,000,000,000 and employing about 1,000,000 workers. This includes the highly successful steel industry based on high-quality indigenous iron ore, manufacture of aircraft, motor cars (including the Australian-designed "Holden"), non-ferrous metals, pulp and paper to a large extent derived from eucalypt hardwoods—a technical achievement of some merit—and sufficient petroleum refining capacity to meet Australian domestic requirements.

What are the problems this growing industry has to face? These are (*a*) a small market by comparison with those enjoyed by the well-established industrial countries; (*b*) expensive transport and distribution costs; (*c*) scarce and expensive but very adaptable labour; (*d*) raw materials which may have to be imported or brought from long distances inside Australia; and (*e*) a shortage of housing caused by rapid increase in population.

Most of these growing pains will be relieved as the population increases and particularly as the development of separate industrial complexes in the States reduces the strain on transport. At present a manufacturer in Melbourne, if he wants to cover the Australian market, may have to send his goods 1700 miles westward to Perth or 1000 miles northward to

(*Photo: E. J. Langford*)

The famous bridge *spanning Sydney Harbour as it is seen from the new I.C.I.A.N.Z. office. Three-quarters of the Australian population live in the big cities.*

(*Photo by courtesy of High Commissioner for Australia*)

Cattle-droving in Western Australia. *These animals when fattened will be driven to north coast slaughtering centres. The frozen carcasses are then flown to the east coast for export.*

Brisbane, not to mention long distances inside each State. A factory in each State may be the answer eventually, but in many cases the separate demand for the time being is too small for economic production. The transport system will require attention, particularly the railways. Settlement in Australia developed in a number of *separate* colonies, and there are still several disconcerting changes in railway gauge at the borders. Plans are already under way for dealing with the most urgently needed unification, that between Sydney and Melbourne.

A rapid and controlled increase in population is a vital necessity for Australia. The Australian Government has a definite policy with a target of 20,000,000 in 25-30 years' time. To supplement the natural increase in population, much is being done to keep the increase from immigration above 1% a year; at present it is much higher. The whole operation of immigration is very carefully planned by the Australian Government: the numbers, the nationalities, the skills, the age groups and the fitness are all carefully regulated. The result is a rate of population increase at present comparable to that achieved in the United States in the heyday of its expansion.

The British migrant is absorbed easily, and quickly appreciates that the differences between the Australian scene and our own are subtle and intriguing rather than striking. The non-British migrant, or "New Australian" as he is sometimes called, usually fits in well and in fact is contributing Continental skills and habits that bring a cosmopolitan flavour which Australia lacked not more than ten years ago.

What part does I.C.I. play in the development of Australia? We have established in I.C.I.A.N.Z. a

Scrub land and good land. *Although many acres of scrub land, like that shown above, have been brought into production by treatment with trace elements, water is always the critical factor in Australian agriculture. The picture below shows typical good farming country in the plains below the Australian Alps, where water abounds and the climate is kind.*

(*Photos by courtesy of High Commissioner for Australia*)

(*Photo: E. J. Langford*)

East coast beach scene. *The east coast of Australia boasts some of the best bathing beaches in the world, where jaded city dwellers relax at week-ends.*

company with an issued capital of £A.18,010,000, a turnover of £A.37,000,000, and complement of 6500 staff and workers. In other words, it would be fair to look on I.C.I.A.N.Z. as comparable in size to a major I.C.I. Division.

Who owns I.C.I.A.N.Z.? The units from which I.C.I.A.N.Z. was formed were almost wholly owned by I.C.I., but the company has taken into partnership firstly some of the most important Australian industrial concerns, and secondly the Australian public. While therefore I.C.I. holds a controlling interest, our partners are Australians, and Australian money is readily available when new capital for development is required.

What does I.C.I.A.N.Z. manufacture? A very wide range of products. They include alkalis, chlorine and chlorine products, including weedkillers and insecticides, commercial explosives, ammunition, ammonia, slide fasteners, coated fabrics, polythene film, polyvinyl chloride and compounds, rubber chemicals, and phenothiazine for sheep drenching.

On the chemical side, dyestuffs and fine chemicals such as pharmaceuticals are the most notable omissions from the I.C.I.A.N.Z. manufacturing range. The complexity of the organic chemical industry demands a large market, and this has placed limitations on local manufacture. Currently I.C.I.A.N.Z., besides constantly expanding established plants to meet increased demand, is concentrating on polythene manufacture (a first unit has just started up), and the long-term development of a magnificent new manufacturing site near Wollongong, New South Wales. Adequate provision for the company's administrative requirements is being made by the erection of new office buildings in Melbourne (£A.3,250,000) and Sydney (£A.1,100,000)—officially opened on 31st October 1957.

In case you are considering what effect manufacturing development by I.C.I.A.N.Z. has had on our exports to Australia from this country, it should be mentioned here that, although over 70% of the value of I.C.I.A.N.Z. sales is represented by products made in Australia, exports by the I.C.I. Divisions amount to the not inconsiderable figure of £4,000,000 a year, f.o.b. U.K. port. The pattern of our export trade is constantly changing. 'Terylene,' plastics, pharmaceuticals and dyestuffs are replacing salt, soda ash and ammonium sulphate, which were the mainstays twenty years ago.

The reasons for our large investment in the Australian chemical industry are complex, arising partly from early developments and partly from present-day conditions. The growth of I.C.I.A.N.Z. manufacturing activities has kept pace with the general industrialisation of Australia. Although our prosperity as a nation depends on our overseas trade, we have always realised that there is no positive virtue in moving goods from place to place across the face of the earth. Manufacture must always be considered in any territory where a demand exists large enough to justify the erection of an economic unit.

Basically, in a free trade world an economic unit means a plant big enough to produce, after reasonable return on capital, a product capable of being sold at a price equal to or better than that of a similar imported product.

Complex Situation

This simple situation is complicated (*a*) by the desire of customers to have the assurance of supplies from a locally established factory, (*b*) by the action of competitors who may be prepared to operate at a low return to become established in the market, (*c*) by the action of governments prepared to foster industrialisation by such means as tariff protection, exclusive licensing of manufacture, and the setting up of nationalised undertakings, (*d*) by factors such as currency restrictions and import licensing, which encourage local manufacture.

Before 1930–31, the depression years in Australia, there was little industrialisation; and the activities of I.C.I.A.N.Z. were also limited in scope. Explosives and chlorine manufacture had been established, the latter during the first world war. These are expensive materials to ship round the world and are obvious cases for local manufacture. The depreciation of the Australian currency in 1931 introduced a new factor —the effect being equivalent to a 25% tariff protection—which encouraged local manufacture. Between that date and 1940 I.C.I.A.N.Z. established manufacture of slide fasteners, ammunition, leathercloth, synthetic ammonia and soda ash.

The second world war provided a stimulus of another kind. Australia was virtually cut off from supplies of many important materials previously imported. New chlorine capacity was created, and with it chlorine-using manufactures such as D.D.T., benzene hexachloride, weedkillers and polyvinyl chloride.

In the ten years after the war, cost inflation in Australia was more rapid than in many of the countries likely to export manufactured goods to Australia, so that some of the Australian manufacturers now require a tariff protection unnecessary in the early stages. Since 1952 import control has been necessary to redress Australia's balance of trade. This has provided protection in another way.

Trade Dilemmas

All this does not add up to a perfect situation, and life is complicated by the waywardness of customers who, being human, want to buy in the cheapest market when the balance of trade permits free import, and want to have supplies guaranteed from local sources when imports are restricted. The remedy lies in increasing the scale of operations and reducing costs by improved efficiency, so that local manufacture will be able to compete with imports under all circumstances. Action on the second rests with us; the first depends on the overall development of the country.

Side by side with industrial progress has gone the development of primary production and mining. For many years to come Australia's ability to pay for imports will depend on earnings from wool, wheat, butter, meat and metals.

More Wool and Meat

Much is being done to develop the output of these basic commodities. Myxomatosis, a disease of rabbits deliberately introduced, has increased the yield of existing pastures and permitted an increase in wool production from 1,080,000,000 lb. in 1950 to 1,414,000,000 lb. in 1956. Less than 10% of the Australian wool clip is used domestically, and the value of the remainder at £A.485,000,000 represents about 48% of the export income.

The extent of Australian pastures is being increased also by treatment for trace element deficiency. Many acres of land in good rainfall areas, previously barren and referred to as desert, are being cleared of scrub and developed following the discovery that lack of fertility was merely due to the absence of elements

(*Continued on page 85*)

People and events . . .

I.C.I. Fellowships and Zeta

THE I.C.I. Fellowship Scheme has been extended to all the universities in the United Kingdom, to the University College of North Staffordshire, and to Trinity and University Colleges, Dublin. The scheme will now cost the Company about £93,000 a year, the 103 individual fellowships being worth between £700 and £1000 a year.

The news that the scheme has been extended may conjure up in some people's minds the vision of more and more scientists up and down the country grinding out research for the benefit of I.C.I.

In actual fact there are absolutely no strings attached to the Fellowships. They enable outstanding scientists to carry out post-doctorate research at universities in the fields of chemistry, physics, engineering, pharmacology and allied sciences, but the universities make the appointments and I.C.I. exercises no control over the matter or manner of the research.

* * *

If I.C.I. does not benefit by the research, who does? One answer to that question can be found in the recent announcement that temperatures of 5 million degrees centigrade have been achieved in the Zero Energy Thermonuclear Assembly at Harwell. The leader of the Atomic Energy Research Establishment's ZETA group was **Dr. Peter Thonemann.** Dr. Thonemann was an I.C.I. Fellow, and used his grant to study gas discharge phenomena and their applications in nuclear science at the Clarendon Laboratory, Oxford. Later he moved to Harwell, where his knowledge of gas discharge phenomena was directed towards the achievement of a controlled thermonuclear reactor.

More than a Pinch

DURING the big freeze-up in January Salt Division received orders for more than 20,000 tons of ground rock salt for snow clearing. At the Division's big stockpiles at Winsford, which had been built up during the summer and autumn, mechanical shovels were loading lorries and rail trucks at the rate of 3 tons a minute, day and night, for despatch to places as far apart as Kirkcudbright and Falmouth.

The demand would have been greater still if some local authorities had not built up pre-winter stocks of

their own. Ground rock salt is, so to speak, self-thatching; it can be stored in the open because as rain falls it forms a slight crust on the pile of salt, and any further rain runs off. Before Salt Division started advocating outside, out-of-season storage in 1954, only about twenty local authorities had adopted the idea. Now 500 of them have taken it up.

Go-ahead local authorities use a special type of mechanical spreader which gives an even spread of ground rock salt on the roads. As soon as snow begins to fall the spreaders go out, for if the salt can be put on the roads before the snow is compacted into ice by traffic it makes a tremendous difference. The disadvantages of hand spreading, apart from the heavy labour costs, are that it cannot be accomplished quickly enough and also that it is likely to lead to potholing—a large dollop of salt on compacted snow quickly produces a crater.

Y.I.M.

YORKSHIRE Imperial Metals Ltd., the new company formed jointly by I.C.I. and the Yorkshire Copper Works Ltd., is now in being, with assets worth about £18,000,000. **Dr. James Taylor,** I.C.I. director responsible for Metals and Nobel Division, has been named as chairman, and on page 94 he answers some questions about the new company.

The End of Garden Notes

IT will not go unnoticed—particularly by those readers who are keen gardeners—that Philip Harvey's "Garden Notes" do not appear in this issue of the *Magazine*.

Instead, the "People and Events" feature has been expanded by two pages, to provide more space for Company news. This pattern will be followed in future issues, because it is felt that gardeners are well catered for in many newspapers and magazines, while the *Magazine's* real function is to provide I.C.I. people with I.C.I. news.

Toothless, Invisible

A SLIDE fastener that is invisible and feather-light and that will not damage fine fabrics has long been the dream of garment manufacturers. Now their dream has come to life in the shape of the 'Nyzip,' the new nylon zip made by Lightning Fasteners Ltd.

The 'Nyzip' makes conventional metal slide fasteners look like something from the Bronze Age. Unlike metal zips, it has no teeth to get damaged or displaced—merely a continuous nylon filament on each side. Its lack of teeth makes it a "natural" for dresses, lingerie and knitwear. Even the flimsiest fabric will not be damaged if it is caught in a 'Nyzip'—in fact it is almost impossible to catch any material in this fastener, for the working parts are covered completely, back and front, by the fastener tape. Should an edge of the material be caught it can be released by breaking open the fastener, which can then be re-zipped.

* * *

'Nyzips' made their first public appearance on 20th February, when top London designers showed dresses incorporating the new fastener. "Public appearance" is something of an overstatement, because the new zips were virtually invisible. By the end of March they will begin to be used on dresses, skirts, trousers, pockets, knitwear and lingerie, and by about the middle of the year they should be on sale in the shops for home dressmakers.

'Nyzips' are being made at the Waunarlwydd factory of Lightning Fasteners Ltd. and will soon go into production in many of the Company's overseas factories. They were designed originally by the Danish firm of Lystager and developed jointly by them and Lightning Fasteners. I.C.I. has the manufacturing and selling rights in most of the important world markets.

Trade Mission

THE purchases controller of C.I.L., **Mr. Eric J. Wain,** was a member of the 50-strong Canadian Trade Mission which spent a month in Britain recently.

Mr. Wain, who was chairman of the chemical group, found the visit an exhilarating experience, despite the gruelling hours kept by the mission—most days started at 6.15 a.m. and ended at midnight.

He had some nice things to say of the factories he saw, of British workmanship and ingenuity, and of our good labour–management relations. But he also said there had been "frank and free discussion" of the three main problems concerned with buying British: failure to meet delivery dates, lack of "before and after" service, and incorrect specifications for Canadian needs.

Bird's Suggestion

THIS story of how a budgerigar won £3 for his master comes from General Chemicals Division.

Mr. W. J. Costons, who is a chargehand process worker in the chlorine section of Bain Works, has a budgerigar at home. The bird's equipment includes a gadget known as a water fountain feeder, and Mr. Costons realised that with a little modification he could turn it into a portable device for containing the caustic soda solution used in chlorine testing in the cell room.

Three other works in the Division have adopted this simple but effective idea.

Explosives on Ice

THE seismic shots that **Dr. Vivian Fuchs** has been firing every 30–50 miles on his route across the antarctic continent were made possible by a Nobel Division contribution to the expedition.

The Division contributed supplies of 'Nobel's Explosive 704' from Roburite Factory, exploders, seismic electric detonators from Westquarter, and delay detonators and 'Cordtex' from Ardeer.

The object of the seismic shots is to determine the depth of ice above bedrock, and the technique used is the same as that used by prospectors the world over. The charge is fired in a vertical borehole, and the detonation sets up shock waves which are reflected by the various layers in the earth's crust. The reflected vibrations are picked up by sensitive instruments called geophones, which are placed at various distances from the borehole, and recorded at a central point.

Scholarship at Blackpool

TWO years ago the Company decided to award some prizes for open competition at Blackpool Technical College, which is attended part time by many I.C.I. employees in the area. They were for full-time General Certificate of Education students and for part-time students taking the Ordinary National Certificate in Chemistry.

On the strength of their work at Blackpool last year, three I.C.I. men have won the three prizes open for chemistry students. They are **Mr. R. E. Crellin** of Plastics Division, Hillhouse, a first year student; **Mr. Arthur Alcock** of General Chemicals Division, Hillhouse, a second year student; and **Mr. J. Doran** of Dyestuffs Division, Burn Hall, a third year student, each of whom was judged the best student in his year.

Mr. Alcock and Mr. Doran are both laboratory assistants. Mr. Crellin is a shift tester in the 'Corvic' laboratories who is in his early thirties. He has managed to find time for "homework" even though he has five young children.

First Polythene at Botany

AT 7.30 a.m. on 22nd December 1957 **Mr. Bill Boyce,** shift superintendent at the I.C.I.A.N.Z. plastics factory at Botany, gave a three-word order: "Put pressure up!" With **Mr. Tony Woolner** and **Mr. Bill Davies** from Wilton he watched tensely as the needle on a pressure gauge rose to 20,000 lb. to the square inch. "Start the reaction!" said Mr. Boyce. A button was pressed, and not long afterwards the first polythene to be made in Australia emerged

in a ribbon, the climax to years of preparatory work.

The plant has cost £A2¼ million, and extensions to it are already under way. When it is in full production it will save Australia £A2 million of much-needed foreign currency a year, now used for imports of polythene.

Another "first" was scored for polythene at the I.C.I.A.N.Z. explosives factory recently, when a 1 ft. diameter pipe was made and laid underground to carry cooling water contaminated with acid. Nobody in Australia had ever extruded a polythene pipe bigger than 6 in. in diameter, and to produce a 1 ft. pipe looked at first like being an impossibly expensive job.

Fortunately I.C.I.A.N.Z.'s plastics technical service officer, **Mr. Ronald Potter,** had met the problem before—at the Widnes Works of I.C.I., when he was plastics workshops manager in the Chief Engineer's Department of General Chemicals Division. On that occasion he had designed a machine for casting 3 ft. diameter pipe centrifugally. For I.C.I.A.N.Z. he drew up the design again, and two weeks after the machine had been delivered the pipe was in the ground.

Two-and-ninepenny Organ

Mr. Tommy Hutton, who for 15 years worked at Billingham's Prudhoe factory until he had to leave because of illness, thought he would like to buy a cottage organ. While he was away on convalescence he asked a friend to try to get him one at a saleroom.

He was astonished to hear by letter that his friend had bought one—for 2s. 9d. (2s. 6d. plus 3d. auctioneer's commission). On his return Tommy inspected it in the saleroom, still hardly able to believe it, then noticed that next to it was another organ which looked in even better condition. He decided to put the one bought already back into the sale and bid for the other one. The price level remained steady, however, and Tommy got the new organ, again for 2s. 9d.

When his previous one came up for sale nobody made a bid. So Tommy found he had two organs for a total of 5s. 6d. He left the first one in the saleroom as a gift, and polish, varnish,

NEWS IN BRIEF

Fish fly in Polythene. For the first time live fish have been transported by air—in a polythene bag filled with oxygen and water. The fish were 24 in. long beaverfish, native to Eastern Canada, and they were flown to Paris for exhibition there.

Olefine Works hoist Safety Flag. To celebrate the completion of the first 500,000 hours' accident-free run at Olefine Works, Wilton, Dr. K. W. Gee, the works manager, hoisted the works safety flag at Wilton's Piccadilly Circus. The accident-free run began on 29th July 1957.

How the Other Half Works. Chemists and engineers at the I.C.I.A.N.Z. Botany Factory went back to the classroom on a three-day course designed to explain the contribution of the commercial staff to the factory's prosperity.

Silicones and the Monte. Equipment of the Ford Zephyr team in the Monte Carlo Rally included a small packet of I.C.I. silicone grease for smearing over the ignition system if wet or flood conditions were encountered.

Mossend Gifts for Pensioners. £21 of the £35 won by Mossend Factory for completing 400,000 accident-free hours was put to the £26 collected in the club to provide a £1 New Year gift to the factory's 47 pensioners.

1000 Pints Given. 1056 people attended the recent blood donor sessions at Billingham, and the total of blood given was 1004 pints.

Affiliated to Ayrshire Yeomanry. After an association with the Royal Scots Fusiliers that has lasted nearly half a century the Ardeer Army Cadet Company is being affiliated to the Ayrshire Yeomanry.

Water Ski-ing? The big freeze-up at the end of January meant the postponement of the Billingham v. Middlesbrough rugby game. The Middlesbrough team issued a ski-ing challenge instead, but the weather had the final say: the sudden thaw meant that both rugby and ski-ing were ruled out.

More Drums. Extensions being made to the drum-making plant at Billingham should boost production from last year's total of 638,599 drums to over 900,000. The plant has been in operation since 1926.

Night Ski-ing. Flares made at C.I.L's Brownsburg works have been adopted by skiers for night ski-ing on the slopes of the Laurentian Mountains.

On View at Brussels. A carving, mainly of 'Perspex,' of the Resurrection scene covering 1000 sq. ft. will be on show at the Brussels Exhibition next month. It is the work of Dr. Arthur Fleischmann.

Cooks Confer. Over sixty Divisional canteen staff attended a conference at Millbank. Main topic under discussion was work study in the kitchen.

Stand-in for Scotland Yard. A new series of crime films which will be shown in A.B.C. cinemas from April has an opening shot of what purports to be a Scotland Yard record room. The real location is Central Registry on the third floor of I.C. House, Millbank.

Apple Scab. A new fungicide for apple scab, 'P.P.' Liquid Mercury Plus, has been developed by Plant Protection Ltd. and will be available to commercial growers this season.

Winnington Diesel Named. The first diesel locomotive in Alkali Division has been named F. A. Freeth after Dr. F. A. Freeth, former Division Research Manager. Dr. Freeth took the controls for a short trip round the works after the naming ceremony.

Warm Beer. Because of complaints that beer sold in one of the Billingham Synthonia Club's bars was warm, canvas jackets have been made for the canisters so that 'Drikold' can be placed round them.

Interpreting I.C.I. Six Belgian girls engaged as interpreter-receptionists for the I.C.I. stand at the Brussels Universal and International Exhibition arrive in London this month for a five-day course on I.C.I. Between them the girls command seven languages.

Players Taped. Synthonia dramatic section have entered a tape recording competition organised by a national Sunday newspaper which offers £75 first prize for the best recorded extract from *The Importance of being Earnest.*

and a run-round with the vacuum inside the works on the other one at home put it into excellent playing fettle.

Blind Student's Success

An amazing story of courage and persistence was told in the *Manchester Evening Chronicle* recently. It concerns **Geoffrey Jackson,** the 18-year-old son of a fitter at the Hyde factory of Leathercloth Division.

Geoffrey Jackson was born blind. He attended special schools in Liverpool and Worcester, where he took his G.C.E. with nine passes at ordinary level. Now he has won his way to a music faculty at Manchester University and the Royal Manchester College of Music, where he will study music and singing.

He has also won a £100 Leverhulme Award. A condition of the award is that the recipient shall spend a holiday alone in a foreign country. Geoffrey Jackson plans to spend his at the Salzburg Music Festival this August.

Not content with studying music—which he must read in Braille and play by memory—Geoffrey intends to take further G.C.E. exams in German and French.

Technology Triumphs

Volume III of I.C.I.'s *A History of Technology** has elicited fresh praise from reviewers who found many good things to say of Volumes I and II. "The volumes," writes a critic in *The Economist*, "continue to appear at a speed that is rare for works of collaborative scholarship, and their interest heightens as they approach modern times." *Technology*, the monthly review published by *The Times*, finds this volume "as huge, lively, diverse and intelligent as the astonishing age it describes." After praising the book for illustrating the Promethean benefits of applying science to the practical needs of life, *Technology's* critic concludes: "Moreover, and this is an even rarer merit in a work of scholarship, it should keep both the professor and his nephew amused in front of the fire this winter."

The Times Literary Supplement reviews the volume at some length and states: "The reader receives the impression that everything has been done,

in this very difficult period where also serious overlapping with other volumes is to some extent unavoidable, to present a coherent account of a period of extraordinary change. Historians of science will be particularly interested in what is said of the mutual influence of science and technology in the chapter on metallurgy and assaying. The editors have succeeded in maintaining the high standard of the preceding volumes."

* *A History of Technology,* Vol. III: From the Rennaissance to the Industrial Revolution, *c.* 1500–1750. Edited by Charles Singer, E. J. Holmyard, A. R. Hall and Trevor I. Williams. The Clarendon Press, Oxford. £8 8s.

New Power Station

By the end of this year the new I.C.I. power station at Thornton Cleveleys, Lancs, should be in full operation. It is a very large affair, costing several million pounds, and will supply steam and power to Hillhouse, Burn Naze and Burn Hall works. The high-pressure boilers will be fired by cyclones.

Most of the civil construction work is already complete, and work on the boilers, turbines, auxiliary plant and pipelines is going ahead fast. The first boiler and the first (low-pressure) turbo-alternator should start supplying power to the I.C.I. system this spring. When the second and third boilers and the high-pressure turbo-alternator are in commission the old boilers at Hillhouse, Burn Hall and Burn Naze will close down.

The power station is designed to use some 200,000 tons of coal a year in the early stages, and the London Midland Region of British Railways and I.C.I. are jointly building new sidings to accommodate coal trains.

Sore Throat Cure

Many sufferers from sore throats this winter have had cause to bless the new 'Savlon' Lozenges made by Pharmaceuticals Division. Their mild and pleasant flavour—specially chosen after prolonged tests of a number of "tastes"—conceals a very powerful antibacterial compound, chlorhexidine.

Chlorhexidine is a fairly recent I.C.I. discovery—its antibacterial properties came to light almost by accident as a result of work on the antimalarial drug 'Paludrine.' Since then it has been incorporated in a number of Pharmaceuticals Division's products sold under the trade mark 'Hibitane,' now widely used by doctors and in hospitals throughout the world.

'Savlon' Liquid Antiseptic also relies on chlorhexidine for its effect. 'Savlon' Antiseptic Cream, on the other hand, is based on a different bactericide called cetrimide.

Train-watcher's Log

Since the end of the war **Mr. Peter Allen,** Fibres Group Director of I.C.I., has logged 250,000 miles of foreign travel—much of it on holiday but most of it in pursuit of the Company's business. To his regret trains would seldom have served to take him where he wanted fast enough—he once went round the world by air in 27 days—but wherever he has been he has used his off-duty moments to indulge in his passion of train-watching.

The result is a book that will delight fellow enthusiasts, *On the Old Lines* (Cleaver-Hume Press, 25s.)—an illustrated personal account of what has interested or amused him on the railways of the world.

* * *

Mr. C. Hamilton Ellis, the well-known authority on railways, writes:

In some places to this day the brass and the copper still shine bravely—on old Beyer Peacock locomotives in Portugal, on diamond-stacked shifters of sugar-cane in Fiji. There are green engines in Greece and clean engines in France, and these are the sort of engines that variously puff, wheeze, or thunder through Peter Allen's pages.

There are others, moreover, quite

PEOPLE

Two Billingham apprentices have been presented with Queen's Scout Badges. They are **Jeffrey Foster,** whose father is in Ammonia Works, and **Alan Huckle,** son of Mr. Norman Huckle, a work study estimator in Products Works and scoutmaster of the 1st Norton Group, to which the boys belong.

Nine members of Wilton architectural section staged an exhibition of paintings and drawings at Wilton Castle recently. Outstanding were crayon drawings by **Mr. Imre Toth,** former Budapest University art student, who joined the section a year ago after escaping from Hungary after the October Revolution.

Mr. S. Ellingworth, railway enthusiast, organist, and student of Yorkshire cricket, has retired from Pharmaceuticals Division after 27 years' service. An expert on locomotive design, he has photographed almost every type of British locomotive. His article on I.C.I.'s steam age veterans appeared in the *Magazine* for May 1956.

Dr. K. W. Gee, the newly appointed Olefine Works Manager at Wilton, is captain of Synthonia Rugby Club and has played for Durham County this season.

A pensioner of Liverpool Shipping Office, **Mr. Richard Tyrer**, and his wife celebrated their diamond wedding on Christmas Day. Mr. Tyrer joined the United Alkali Co. in 1892.

Miss Judith Parmella, a shorthand typist in Nobel Division Staff Department, was one of only six candidates to gain a bronze medal out of 4500 who took the Royal Society of Arts intermediate typing exam.

Mrs. Barbara Reid of Product Sales Control Department, Dyestuffs Division, is a member of the Manchester team which will take part in the Festival of Movement and Dance to be held at Wembley later this month.

Pigeon fancier **Mr. Billy Beester** (Pilkington-Sullivan Works) walked away with eight silver trophies and £200 in prize money at the Widnes Federation of Homing Societies annual prize distribution.

Mr. Hugh Munro (Ardeer Trade Workshops) has had his first novel, *Who Told Clutha,* published (Macdonald, 10s. 6d.). Detective Clutha has already featured in a number of Mr. Munro's short stories which have appeared in the *Glasgow Evening Citizen.*

Mr. Maurice Wilkinson, 22-year-old trainee clerk in Billingham Labour Department, has represented Durham County at squash.

Dr. E. Holmes, Development Director of Plant Protection and this year's chairman of the British Weed Control Council, appeared on U.S. television when in Memphis, Tennessee, for the American Weed Society's annual convention.

Mr. J. Cockrill (Commercial Works) won the Grange Trophy in the annual efficiency competition held by the Billingham (I.C.I.) Division of the St. John Ambulance Brigade. Runner-up was **Mr. E. Lancaster.**

Mr. Bill Hamilton (Nobel Division) appeared on B.B.C. television as one of a team of ten dancers of the Royal Scottish Country Dance Society in a programme screened from Hopetown House, seat of the Marquis of Linlithgow.

The Burns oration at the Mossend Burns supper was given by **Mr. T. Miller,** a processman from the Ammonia plant. The haggis was piped in by electrical foreman **Mr. David Brown.**

different. There are some slick diesels and bleakly admirable Dutch electrics. But the great charm of this book is that it realises an ambition of many lovers of steam locomotion. It takes them in most places round the world. We travel hopefully, which one of the greatest of literary travellers found more important than arriving.

One criticises Peter Allen's book unwillingly: to anyone who loves a locomotive it is so enjoyable. One forgives him for describing a Werkspoor engine of the Holland Railway as a Sharp Stewart—but for the roomy cab, it was very like one. One might reserve a brickbat for the publishers, for some of the numerous illustrations have lost in reproduction what one knows they need not have lost. As for Allen's views on the relative beauty of ugliness of this engine or that, one can argue such things till steam goes home. Never mind! We both agree that a mechanical thing depicted at Port Pirie, South Australia, is dire, and that Donegal *Alice* is delicious.

I.C.I. Film Societies

ALTHOUGH the film industry is having a hard time of it, this does not seem to mean that people are no longer interested in films. The fall in cinema audiences has been matched by a rise in the number of film societies, whose members are able to see the classics of their choice when and where they want.

There are several I.C.I. film societies. In Dyestuffs Division, Blackley Recreation Club's film section has been in existence since October last year and has a membership of 140. *On the Town*, *The Big Store*, *La Belle et la Bête* and *Seven Samurai* are among the films they have shown.

At Billingham the Synthonia Club has a film society section with 300 members. They can all be accommodated in the magnificent club theatre, which has a projection box with twin 16 mm. projectors. The screen can be adjusted for use with cinemascope, but in actual fact there are few 16 mm. cinemascope films available. A film society section of the Crossroads Club at Billingham shows films to some 120 members with a portable 16 mm. projector.

* * *

At Head Office a film society has been formed recently, with more than 200 members. Monthly showings began in January with the Marx Brothers film *A Day at the Races*, followed in February by *The Red Badge of Courage*. The society uses the cinema at Imperial Chemical House, which has both 16 mm. and 35 mm. projectors.

At Wilton Castle a film group was formed in 1953, and it now has 150 members. Films being shown in the current season include *Fan Fan la Tulipe*, *Windfall in Athens*, *Battleship Potemkin* and *The Lady Vanishes*. For the first time the group has organised this year a film-making competition open to members of Wilton Castle Club.

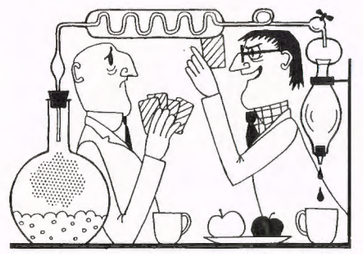
C.I.L. invents a Game

"YOU'RE schniedered!" This strange call can often be heard echoing through C.I.L.'s Paint Research Laboratory in Toronto at lunch time. It signifies that a game of schnieder is in progress—a game invented by several of the employees who regularly play cards during their lunch hour.

Here are the basic rules for schnieder.

The Game

1. Dealer passes five cards to each player.
2. Dealer turns up one card, which is trump.
3. Players decide how many cards they want to keep and discard the rest.
4. Dealer then passes cards to players again until they all have five in their hands. (With seven people the maximum discard is two cards, with six it is four.)
5. Player to dealer's left starts action by placing card face upwards in centre of table and rest of players place or slam their cards on table. The highest card in the suit led, or highest trump card (if player has none of suit led) wins trick. This is repeated until no cards remain in hands of players.



The Scoring

1. All players start with 10 points.
2. One point is subtracted from player's total for each trick won.
3. Five points are added to player's total if he is "schniedered"—i.e. takes no tricks.
4. If a player's score goes above 25, he leaves the game.
5. Winner is the first person to go "all the way," i.e. his score is zero.

Days of the £4 Week

A YELLOWED and tattered 1930 pay slip, uncovered at Billingham recently when a time card rack was being repaired, provides an interesting comparison with even the lowest pay rates of today.

The gross wage shown was £4 1s. 9d. for 76¾ hours worked during the week. The hourly rate given was 1s. ⅝d., with 1s. for holidays and deduction of 1s. 4d. Health and Unemployment Insurance and 4d. hospital contribution.

BINDING OF 1957 MAGAZINES

The Kynoch Press has again agreed to bind *Magazines* and inserts for those readers who would like this done.

The cost will be 12s. 6d. for a volume of *Magazines* or a volume of inserts, and anyone who wants to take advantage of this offer should advise his *Magazine* correspondent now.

NEW APPOINTMENTS

Some recent appointments in I.C.I. are: **Billingham Division:** Mr. I. S. McKay (Distribution Manager). **Heavy Organic Chemicals Division:** Mr. A. J. Barrett (Secretary). **Nobel Division:** Mr. W. J. Hescott (Labour Manager). **Plastics Division:** Dr. W. R. Davis (Deputy Manager, Sales Control), Dr. F. T. Hamblin (Export Sales Manager), Mr. D. G. Owen (Sales Control Manager). **British Visqueen Ltd:** Mr. A. R. Thom (Managing Director).

AUSTRALIA AND OURSELVES (*continued from page 79*)

present in normal soil in small quantities. The addition of a few pounds per acre of copper, zinc and other salts has made possible the grazing of sheep on land which was at one time considered valueless. Because of development costs this land is not cheap; but it is a welcome addition to the productive area of Australia.

The most critical factor in Australian agriculture is the availability of water. For nearly a year after the opening of the Olympic Games in November 1956, rainfall in southern and eastern areas was below normal and the 1957 wheat crop was less than half the weight of recent harvests.

In some parts of Australia irrigation is feasible and provides the answer to shortage of water. Seven years ago the great project known as the Snowy Mountain scheme was launched. This will take another ten or twelve years to complete and will cost £A.400,000,000. It involves cutting the headwaters of certain rivers which normally flow south and east from the Australian Alps, and conveying the water through the mountain range to supplement the flow of the long rivers the Murray and the Murrumbidgee, which water huge areas of country north and west of the Alps. Hydroelectric power will be available as a by-product, but the main benefit will be vastly increased quantities of water for irrigation. Irrigation means intensive rather than extensive agriculture, with a consequent increase in demand for fertilizers, weedkillers, fungicides and so on.

An undertaking of this magnitude is an enormous burden for a small population, but is cheerfully tackled because success provides the means to increase the population, which in turn will make even more ambitious schemes possible in future.

Mining has always made an important contribution to the prosperity of Australia. Gold from the early days and later lead and zinc are now being supplemented by uranium and titanium ores. The most recent discovery is a vast deposit, possibly 600,000,000 tons, of bauxite in Northern Queensland.

Australia is indeed a fortunate land of great natural wealth spread over a wide area—a land without serious extremes of climate or difficult political or racial problems. Its greatest asset is its people, vigorous, well balanced and confident. They have the vigour of youth faced with boundless opportunities, the balance of a predominantly British stock prepared to learn the ways of the world and to make full use of the experience of others, the confidence of a people who have already achieved greatly in their own lifetime.

I believe these people have the skill and the enterprise to solve the problems of maintaining a balance between primary and secondary industry so that the natural products of the land will enable them to buy the equipment they need to develop the land still further, at the same time increasing the population to a size where the manufacturing industry will enjoy markets big enough to be able to stand on its own feet without tariff protection or import restriction of any kind. The present is a period of transition, but the ultimate goal is clear.

THE TRANSISTOR

By John Lewis (H.O. Research Department)

So small that you will probably never see it, the transistor is none the less vital to the development of our electronic age. Sturdy, cheap to run, it will replace the radio valve in many applications. Here in simple language is the story of what it is, how it works, what it will do and why it is expensive.

THE transistor is only a very tiny thing—you will probably never *see* one unless you look for it. But it is a real marvel of modern science—the first device of its kind was described only in 1948, and its potential importance is enormous.

What is it? It might well be described as a distant relative of the "crystal and catwhisker" which was an essential feature of old-fashioned radio sets. It is a tiny piece of material, technically known as a crystal, with "catwhisker" electrical contacts pressing on to its surface. But the differences between the old devices and the new are very important, for the great feature of the materials of which transistors are composed is that they will *amplify* electrical signals in very much the same way as valves do.

Transistor crystals do not actually look like crystals at all. They look more like blobs or wafers of metal—and indeed that is what they are, the metal being germanium; but they are called crystals because the atoms composing them are arranged in regular patterns, just as they are inside common crystals. It is actually this regular arrangement of the atoms which makes ordinary crystals like sugar or soda or Epsom salts have a regular shape not found naturally in non-crystalline materials like glass.

In metals the same regular arrangement of atoms is found without the regular external shape. It is because of this regular arrangement that metals in general are able to conduct electricity, since the atoms provide a sort of lattice-work in which their outer electrons can flow about pretty freely. The materials of which transistors are made are called "semi-conductors," because electrons can flow in them to some extent but not quite so easily as in good conducting materials. They can in fact flow in some directions better than in others, and it is to this fact that the materials owe their remarkable properties.

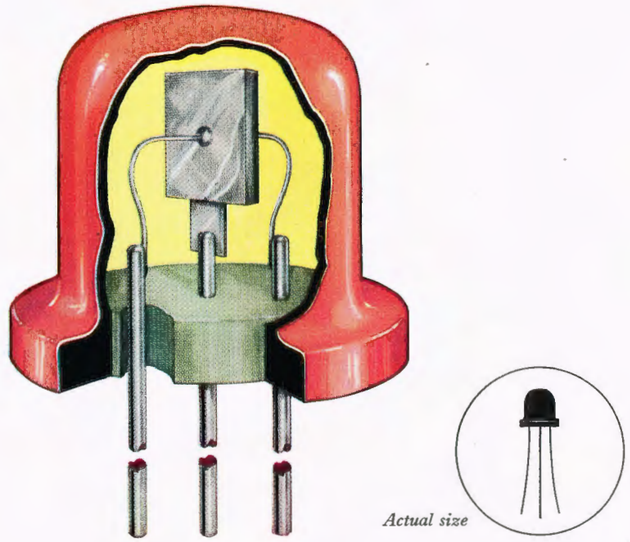
The ordinary radio valve is a device by means of which a substantial electric current, large enough to drive a loudspeaker, can be exactly controlled by the fluctuations of a very tiny current, such as a radio set picks up on its aerial. The discovery which led to the development of transistors was that the tiny crystals of these "semi-conducting" materials could, with the aid of suitably placed contacts, do the same thing.

This was an important discovery. Transistors are small, taking up less room than valves, and also stand up to shock much better. Both these properties are of immense value to manufacturers of electronic equipment, whether it be hearing aids or guided missiles.

Some experiments were done by the guided missile people recently to test how much shock transistors could stand up to, and it was shown by shooting several batches of them from a mortar that they would stand up to accelerations equal to 8000 times the force of gravity. Properly used, in fact, they are pretty nearly indestructible.

But the biggest thing about transistors is that they consume hardly any electric power at all—just a small low-voltage supply. Devices using transistors are thus cheaper to run than those using valves and also give off practically no heat. This last is an important point. Big pieces of electronic apparatus get so hot that special elaborate cooling equipment often has to be installed, and all the valves have to be placed fairly wide apart so that their combined heat does not damage the circuitry. All this adds to size and expense.

In tiny devices like hearing aids, the actual saving in cost achieved by the low power consumption of transistors is counterbalanced, at the moment at any rate, by the much higher capital cost of the transistors themselves, which at their present stage of development are a good deal more expensive to produce than valves. But for the users of really big electronic devices, like modern "electronic



A transistor enlarged approximately ten times

brains," the saving of money on power consumption is a real consideration. One of the biggest of our British electronic computers consumes power at the rate of a small factory; if that sort of expense can be cut down to a hundredth or less, as is possible with transistors, it is a saving not to be ignored.

A further advantage of transistors is that they do not "burn out" as valves do. When you are dealing with a piece of electronic equipment containing thousands of valves this is a very material consideration, particularly when failure of the equipment may mean an industrial or military loss of some magnitude.

So it is not hard to see why electronic engineers have been getting excited about transistors in recent years. They are not likely to replace valves everywhere, at any rate for some time to come, partly because of their expense and partly because they have at present certain limitations—they will not, for example, work well at high frequencies. But they are undoubtedly going to be very important in the years to come, for our age might very well be called the "electronic age" as much as the "atomic age," considering the immense and ever-growing part which electronic devices play in industry, in domestic life and in defence.

The expense of transistors is mainly due to the difficulty of producing the semi-conducting materials of which they have to be made. Germanium is a pretty rare metal, and until its use as a semi-conducting material was discovered it was little more than a metallurgist's curiosity. Now there is quite a drive to find sources of it and extract it from them in the necessary purity. Some idea of its rarity is given by the fact that metallurgists have actually been driven to extracting the very small quantities of it which occur in the soot of gasworks chimneys. This is actually one of the principal sources of the metal at the present time. The point is, of course, that there are extremely minute quantities present in certain kinds of coal, and the process of burning produces a soot with a rather higher concentration of germanium than the original mineral because some of the other substances have been burnt away.

Recently another material has come into use for transistors, namely the element silicon. This is very much commoner in nature than germanium—compounds of it are found in practically all rocks and occur in processed form in several common commercial substances, notably glass. Again, however, the element silicon was little more than a chemist's curiosity until recently, and means of separating it from its compounds and making it pure have had to be worked out. Important work on this has been done by I.C.I. in the General Chemicals Division.

Actually a certain amount of impurity is essential in semi-conducting materials, since it enables their properties to be controlled. But in order to have controlled amount of impurity you have first to start with a material which is very pure indeed. The preparation of *that* has presented would-be manufacturers of transistors with a lot of problems. One method of purification, known as zone refining, is itself a marvel of modern science, which will have a place in its own right later in this series.

Island Monastery

By Peter Brett

Photographs by the author

Thirteen hundred years ago adventurous monks built a monastery on the Great Skellig, a precipitous island off the west coast of Ireland. Here is an account of a visit to the island, now inhabited only by lighthouse men.

THERE is always an air of romance about landing from one's own boat on a lonely and rarely accessible island. But the Great Skellig, a precipitous rock off the west coast of Ireland, is specially interesting because it is linked in a remarkable way with the early history of Christianity.

It was only a few hundred years after the birth of Christ that a community of monks established a settlement in this wild and most unpromising spot, and the little monastery which they built remains to this day, almost unharmed by the centuries.

The west coast of Kerry is fully exposed to the Western Ocean swell, which rolls in almost continuously. In this swell, even in summer, landing on a small island is usually impossible from a normal craft. Even for relieving the lighthouse-keepers on the Great Skellig it is usually necessary to use a long derrick and breeches buoy so that the boat need not attempt to come alongside the landing place.

For a change, however, after the long period of settled weather produced by the anticyclones of May and June 1957, the swell died down. It was then that my wife and I, with two others, were cruising in that part of the world in our sailing boat *Fair Rover*, and we were delighted to find that we had a rare opportunity to land on the Skellig.

We left the Kenmare River on a warm calm morning in complete confidence that we need not expect any serious change in the weather during the following eight hours. Indeed, the wind was so slight that we had to use our small engine from time to time in order to keep to a reasonable programme. There was quite a thick haze, which limited visibility to about five miles. This veiled the beauty of the coastline, but when we reached the islands the haze seemed to enhance the air of mysticism about the whole scene; the mainland was invisible, and we might have been in mid-Atlantic.

The Great Skellig is about half a mile long and a quarter of a mile wide. It rises steeply out of the sea to a jagged pinnacle over 700 ft. high. A ridge about 60 ft. lower runs out towards the north-east, separated from the main peak by a saddle known as

The author's boat "*Fair Rover*" *at the landing place on the Great Skellig. Six hundred steps hewn by the monks led up to the monastery, and half of these remain.*

Stones without mortar *were used for all the buildings. Most of them, like this oratory, are still in good repair.*

The largest "beehive" cell, *with Little Skellig in the background. The projecting stones may have been used to anchor thatching.*

Christ's Valley. It was just below the top of the ridge that the adventurous monks established their settlement.

Towards the north-eastern end of the larger island there is a big cave with deep water running right into it. A landing place has been established on a small promontory of rock at the mouth of this cave. The water round the island is about 160 ft. deep, which is too great for anchoring with normal tackle, but the swell was so slight that we found we could lay *Fair Rover* right alongside the landing quay and tie her up there. This was far beyond anything I had hoped for, as we knew no more about the landing place than its approximate position before we arrived there.

The monks built about 600 steps out of great slabs of stone to provide a way up to their precincts. The lower of the original steps have gone, but about 350 of the upper ones remain. The path to the lighthouse, and a few more recent steps, give access to these. Interest was added to our climb by the thousands of birds, the most obvious of these being the puffins and razor-bills, which were incredibly tame, allowing one to approach within a few feet.

There were also hundreds of kittiwakes nesting in full view, but the shearwaters and stormy petrels were away in their burrows. Almost the only vegetation is the sea pink, which flourishes in great thick cushions.

We knew no details of the monastery beforehand, and it was an extraordinary thrill to emerge—rather breathless—from the little low tunnel leading into the main enclosure and find ourselves suddenly in a settlement of man-made stone dwellings which must have been almost unchanged for about thirteen hundred years.

The haze was thinning at this height, and feeble sunshine gave good conditions for colour photographs. These show how the "beehive" cells were built from dry stones with no mortar and no separate roof structure. The walling skill of these monks must have been quite extraordinary for these buildings to have survived so long. In addition to five of the original cells which are still complete, there is one partly ruined. The original little oratory remains, and there are the ruins of a second later oratory, known to have been built before the twelfth century. The monks' cemetery can be identified by the little tombstones.

Four other cells *remain, and the ruins of a sixth. A large "cross-stone" can be seen on the right.*

The cells are said to remain quite dry inside in any weather, but it is believed that the monks used to thatch them (presumably to keep the draughts out!), and the thatch was fastened to the projecting stones.

Inside, the cells are roughly square in plan, the walls varying in thickness from about five feet to about eighteen inches.

The date of the foundation of the monastery is not known, but there is good evidence that it was sacked by the Danes in A.D. 823, and it may well have been in existence for several hundred years before that. Some say that it was founded as early as the fourth century—before the days of St. Patrick—by Christians hounded out of the mainland, but it is more likely that the first monks went there as a deliberate act of self-denial after the conversion of Ireland to Christianity.

We were very thoughtful as we returned to *Fair Rover* to sail round the Little Skellig, white with its thousands upon thousands of birds, and to make our way back to the beautiful little natural harbour of Darrynane, ten miles away on the mainland. It seemed almost incredible that human beings should have decided to isolate themselves on the Skellig.

Their contacts with civilisation through the mainland of Ireland must have been very rare and entirely unpredictable. Yet these men were of the very few who could read and write and had the most to gain from contact with civilisation. One wonders how they found, on the Skellig, even the means of bare existence. For food and clothing they must have been largely dependent on the occasional visit to the mainland, and one suspects that they must often have been close to starvation, keeping themselves alive perhaps on sea birds and their eggs, and occasionally fish.

The present state of the buildings shows how well chosen was the site of the main settlement, on the more sheltered side of the isle and high enough to be out of reach of the most boisterous seas.

The significance of the height of the settlement is brought home when one realises that the lantern of the lighthouse, 200 ft. up, was smashed by the sea in a winter gale a few years ago and the light extinguished. Although the settlement has to withstand the onslaught of rain and wind in their full ferocity, it hardly ever freezes in the island—a very important factor, since ice is perhaps the most destructive force at work on old buildings in most parts of the British Isles.

POLYTHENE FILM FORGES AHEAD

By R. F. Zimmern (British Visqueen Ltd.)

British Visqueen Ltd., I.C.I.'s subsidiary company marketing polythene film, continues to make spectacular progress. Last year sales were 55% up on those of 1956, and a further 30% rise is expected this year. Here is a survey of the new markets opened up by lower film prices.

GREATLY increased sales; a reduction in price; and a wider range of applications—these were the forecasts made in the *Magazine* eighteen months ago in reviewing polythene film prospects. How true have they proved to be?

Taking sales first, British Visqueen Ltd. sold last year 55% more than in 1956—itself a record year—and this year sales are confidently expected to rise a further 30%. Increased production and efficiency have lowered costs, and two price reductions have been made during the past eighteen months; and cheaper film—it is now competitive with many grades of transparent cellulose film—has opened up new markets and new applications.

Much of this is due to new and extending applications in the packaging field; "blister" packs vacuum-formed from polythene film are an example. But there are opportunities for large markets outside the packaging industry, and it is in these that spectacular developments may take place in the next few years.

Already, in the horticultural trade, polythene film is being used on an extensive scale. It was introduced in the autumn of 1955, under the trade name of 'Thermoplus,' as a cheap and convenient heat insulant for greenhouses. This has been highly successful—and it has also proved itself invaluable in a hundred other different ways in commercial nurseries. These range from weather protection frames for early-flowering chrysanthemums to growing the actual cucumbers "pre-packed" in polythene sleeves on the plant!

In addition, Plant Protection are marketing for the commercial grower 'Soluply,' a black perforated 'Visqueen' tube which gives an accurate, labour-saving means of feeding liquid fertilizer to plants and of watering them.

Allied to these horticultural uses are agricultural ones. So far in this country, apart from the produce pre-packaging side, polythene film has not been widely used, but in America much work has been done with it as a crop protector and for the coverage of silage, and the results appear to be very promising.

Another market which B.V.L. is developing is the building trade. Here the possibilites are immense, for it offers to the contractor a material with unique properties—tough, water resistant, transparent, flexible and easily handled. All these properties were shown to spectacular effect at the B.V.L. site recently. Bulk storage silos for I.C.I. 'Alkathene' granules had to be erected and welded in situ because of their size. This necessitated temporary housing for about six weeks. Marquees were out—not even Bertram Mills' Big Top size would do the job, because of the clearance height required for the crane. Then someone thought of 'Visqueen.' The result was a scaffolding structure with a capacity of about 110,000 cubic feet completely encased—in 1½ days—in 500 gauge 'Visqueen' film. It stood up to the gales of late May, the brilliant sun of June and early July, and the rain that followed.

Will it be, perhaps, a technique of the future to build under vast polythene film structures completely independent of the weather? It is too early yet to say, but there is no doubt that this material is going to help materially to reduce lost working time due to bad weather by protecting workers on scaffolding and keeping wind, rain and frost out of partially finished buildings.

A new use for polythene film. *A large scaffolding structure embracing 100,000 cubic feet has been completely encased in 500 gauge 'Visqueen' film, an operation which took 1½ days. Inside this covering the job of erecting and welding bulk storage silos of aluminium went on regardless of weather conditions.*

The applications for 'Visqueen' in the building industry are more than just a protection against the weather. At Gatwick Airport it has been extensively used as a permanent membrane under the concrete runways, and on top of them as a temporary curing cover. Damp-proof membranes and temporary water storage are other uses for the material.

In its more traditional packaging world polythene film continues to gain wider acceptance every day. High-quality multi-colour printing permits striking designs for packs, while for bulky articles such as sheets and blankets, colour printed, tough, shockproof overwraps have brought about a new concept of packaging.

Efficient pre-packaging of fruit and vegetables with adequate presentation has only been made possible for certain items by polythene film. Demand follows the enormous growth of the self-service type stores, which are changing the shopping habits of the nation wherever they appear. The rise in sales of pre-packed potatoes, for example, has been quite phenomenal. In 1954 it was estimated that 100,000 pre-packs of potatoes were sold. In 1958 the estimate is one hundred million! The extension of pre-packaging of fresh foods, meats and fish, fruit and vegetables is going on unabated—though not all of it in polythene.

This article began by looking back at past forecasts. Higher sales of a cheaper product for a wider range of uses is still the prophecy, and the pace is likely to continue. The development of new polymers opens up new possibilities for special films and for new applications requiring special physical characteristics; the potential stimulus of the European Free Trade Area; and an increasing readiness on the part of industry and agriculture to experiment with new materials and new techniques—all these things augur well for the future of polythene film.

YORKSHIRE IMPERIAL METALS LTD.

At the beginning of last month the heralded amalgamation between the common interests of I.C.I. and those of the Yorkshire Copper Works took place. A new company—Yorkshire Imperial Metals Ltd.—was formed. Dr. James Taylor, I.C.I. Group Director who negotiated this amalgamation, is the chairman of the new company, and here answers some questions.

EDITOR: *I think, Dr. Taylor, that the question uppermost in people's minds is just how the amalgamation will affect the lives and working conditions of so many Metals Division people; but before we come to this, could you perhaps say briefly why this amalgamation was decided?*

TAYLOR: The short answer is that the tube and fittings business—I use this phrase as a shorthand note to cover a much wider field—was running into serious difficulties and it was necessary to find means of reducing costs and increasing efficiency. Take I.C.I. and Y.C.W., for instance. We both made similar products. We were duplicating our production, technical service and sales efforts, and expending great energy in competing with each other at home and abroad. I.C.I. needed more orders if the great new Kirkby works was to be kept at that very high level of production which alone can give a reasonable return on a big capital investment. On the other hand, Y.C.W. sometimes had too many orders for their capacity and planned to build new plant which meant spending large sums of money, notwithstanding the fact that the two firms *between them* had adequate plant. The sensible thing was to come together.

EDITOR: *Was the prospect of a European Common Market a factor in your calculations?*

TAYLOR: Certainly; but we must distinguish between the Common Market and the proposed European Free Trade area. The Common Market, the customs union between France, Western Germany, Italy and the Benelux countries, is a customs union with a common tariff round the outside and, ultimately, free trade within. By itself it threatens to close important continental markets to us; but if the larger European Free Trade area is formed to include the Common Market countries, the U.K. and other countries, we should have Free Trade relations with the Common Market and these other countries. We should be faced with the challenge of severe competition both at home and in the rest of Europe from other countries, especially Germany; but at the same time, if only we can meet the challenge, there is the prospect of a lot more business in Europe. After all, a large free trade area covering all Western Europe should result in a larger volume of trade —for ourselves and our competitors alike. All this made it most urgent to put our own house—or should I say houses? —in order.

EDITOR: *"Houses in order." Just exactly what do you mean by this phrase?*

TAYLOR: Well, the amalgamation will certainly lead to greater efficiency. In the first place, there will be no duplication of research, technical service and sales organisations. In each of these spheres there will be in future one organisation instead of two. This, I am afraid, will inevitably raise problems of adjustment; but these things have to be sometimes, otherwise you may lose business to more efficient foreigners, and then the employment of a large number of people would be threatened. Secondly, the amalgamation will enable orders to be placed where they can be most efficiently filled. This is because the two businesses are largely complementary and dovetail together. For example, bulk copper tube orders suitable for long runs could be concentrated at Kirkby. "Tailor-made" tube orders demanding different skills could be satisfied from other factories.

EDITOR: *What you have said surely raises the question of redundancy. Inevitably there will be some people whom Y.I.M. will not be able to absorb. Can you give an assurance that any I.C.I. people not re-employed by Y.I.M. will be given the option of other jobs in I.C.I.?*

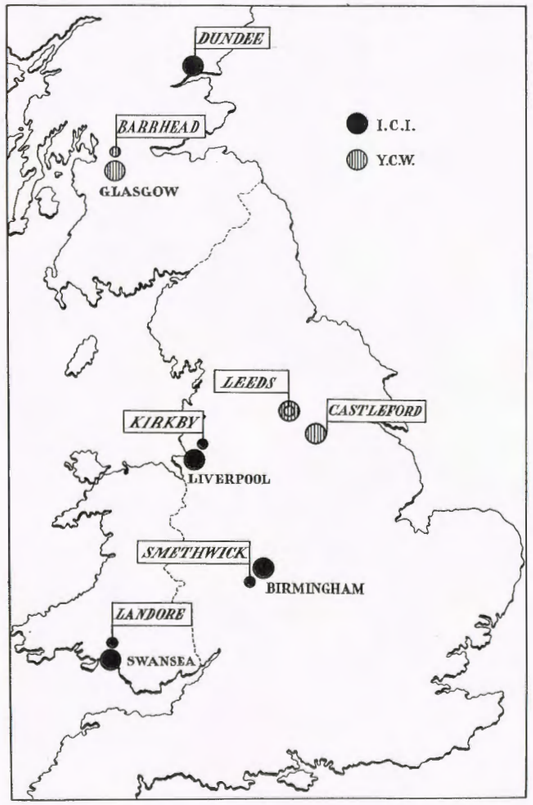
TAYLOR: I cannot be categorical about this because it depends, just as it did in Metals Division, on trading and economic conditions over which we have no control; but I can say that all the workpeople and staff of the factories concerned have gone over to work for the new company. In addition, from I.C.I. Metals Division Headquarters those necessary for the joint business have been transferred. For the time being I.C.I. employees will be seconded to Y.I.M. As soon as possible new terms and conditions will be offered by Y.I.M.

EDITOR: *What about Y.I.M.'s conditions of work? Will I.C.I. conditions prevail?*

TAYLOR: This very important matter is being given the most urgent attention, and we are going to do our very best to ensure for everybody that the conditions of employment shall be satisfactory.

EDITOR: *I know the names of the Y.I.M. board have already been announced, but could you refresh my memory?*

TAYLOR: The share and loan capital of Y.I.M. is owned 50% by I.C.I. and 50% by Y.C.W. Both therefore have equal representation on the Y.I.M. board. There are fourteen directors. The seven I.C.I. directors will be Mr. Peter Menzies and myself; the chairman and two managing directors of the Metals Division, Dr. M. Cook and Messrs. M. J. S. Clapham and St. J. Elstub; and two full-time directors, Mr. W. N. Ismay and Mr. H. Royle. I have been elected chairman of the new company for the first year and Mr. George Norton of Y.C.W. vice-chairman. Mr. Sherborne, who was managing director of Y.C.W., will be the managing director of the new company.



Map showing *the location of factories transferred to Yorkshire Imperial Metals Ltd. by Yorkshire Copper Works Ltd. and I.C.I.*

EDITOR: *Can you give me some idea of the size of Y.I.M. in terms of number of employees, turnover and capital?*

TAYLOR: We put the value of the new company's manufacturing plants and assets at nearly £20 million. As regards numbers, there are about 4000 people from Y.C.W. and rather less than 3000 from I.C.I. As regards turnover, I would not like to commit myself to any forecast. I.C.I.'s turnover in these products was of course only part of the turnover in the Metals Division, and it is difficult to give separate figures; but the overall business was roughly the same as Yorkshire Copper Works. Y.C.W.'s turnover for the year 1955–56, which was a very good year, was £13·3 million.

EDITOR: *Where will the administrative headquarters of Y.I.M. be?*

TAYLOR: At Leeds, where Y.C.W. had its biggest plant and headquarters, and consequently there are offices available, though we shall certainly need additional buildings as soon as possible to house the increased numbers.

EDITOR: *One further question. The list of works which are transferred from I.C.I. to Y.I.M. is, of course, well known to people in Metals Division; but I suspect that other people would like to see it repeated.*

TAYLOR: The new company will take over those Metal Division activities concerned with copper and copper alloy tubes, ferrules, plates and tube fittings, lead and lead alloy sheet and pipe, and zinc chloride. The works involved are Allen Everitt, Fyffe's, Kirkby and Landore. The whole of the Y.C.W. plant and assets are being transferred to Y.I.M.

EDITOR: *Well, Dr. Taylor I hardly think it fair to ask you any more questions. Have you yourself anything you would like to add or emphasise?*

TAYLOR: I would like to say this. We make no apologies for this merger. We feel it is a fine, constructive move and the right and proper thing to do. Nevertheless, I realise what these changes mean in terms of people's lives. There will be people deeply steeped in I.C.I. loyalties and traditions who are now being asked to transfer their loyalties to a new company. All these changes affect people's lives and are not easy. I realise this. The main point is shortly this. We cannot voluntarily continue conditions which might, because of foreign competition or for any other reason, force us under. This new company will be a large and powerful company by any standards, and all its people will think and dream copper, copper alloy tubes, fittings and plates. It should be able to build up a world-wide name for itself as the leading firm in this industry. There will be big opportunities for expanding trade, and altogether it presents a great challenge and a great opportunity, which I am sure will be grasped.

Men with Ideas—2

George Hughes

THE fact that he was once a coal-miner, and his father before him, had the curious result of netting George Hughes quite a handsome sum as a Suggestion Scheme award.

When George first left his Co. Durham pit in 1950 for Dyestuffs Division's Nylon Works at Billingham, he and his father sometimes used to compare safety regulations in the pits with those in the chemical industry. One evening, when they were sitting round the fire talking idly of safety publicity, George's father mentioned that in the mining industry much use had been made of slogans painted on glass lamp panes.

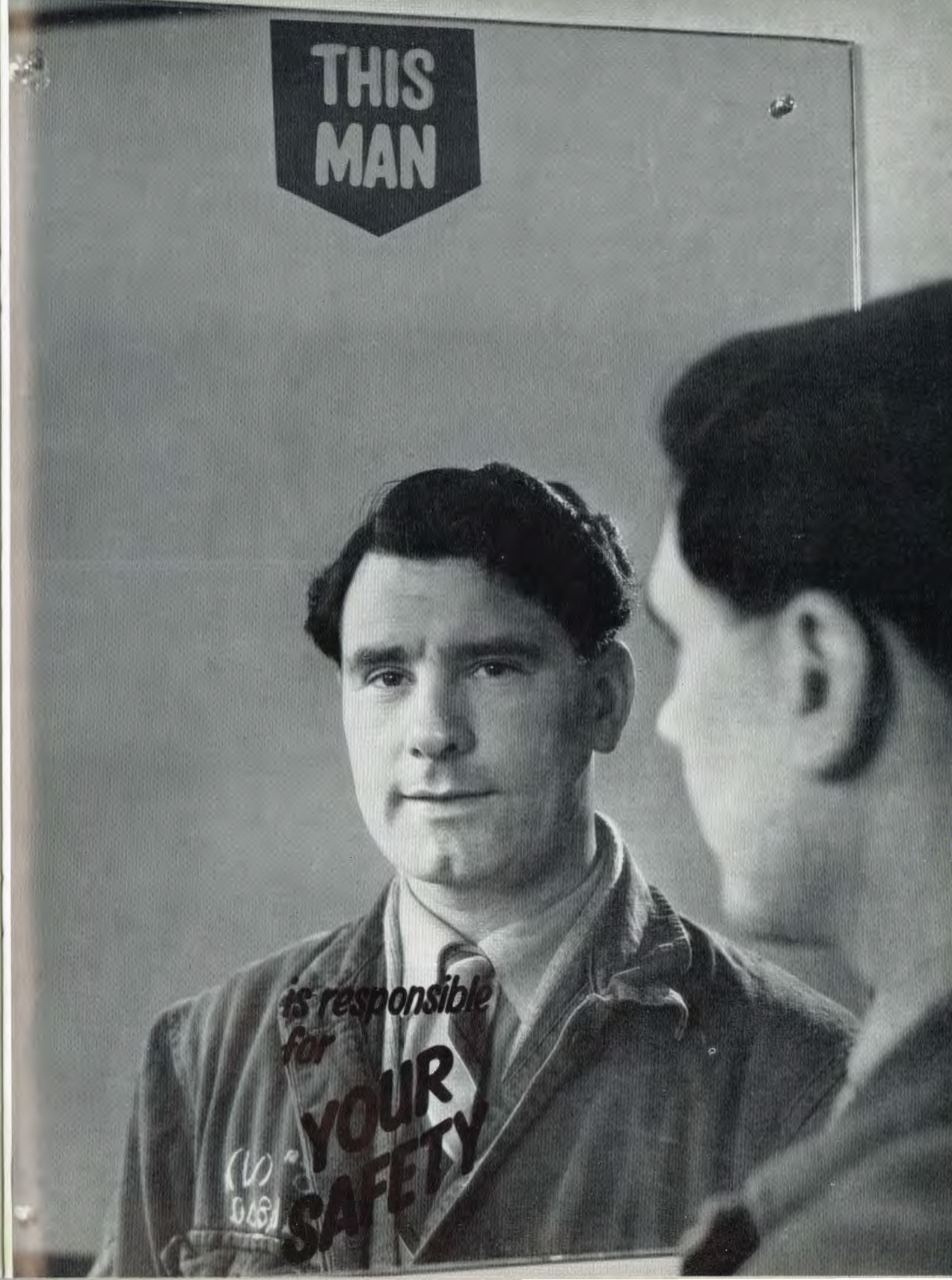
It is rather doubtful whether one of those strip-cartoon bubbles immediately appeared above George's head containing the words "Thinks—why doesn't I.C.I. use this idea?" He probably turned the idea over in his mind for a while. But the final result of his father's chance remark was that George—largely at the instigation of his wife, who thought it might win him 30s.—submitted a suggestion.

The suggestion was that all the mirrors in the works should have painted on them the words "This man is responsible for your safety"—a constant reminder of what every man knows to be true but is sometimes apt to forget.

The suggestion was adopted and brought George £3. Before long nine other Divisions had followed suit. Then the idea was adopted on a Company-wide basis, transfers were distributed to all works (one was made for women, too), and George's award rose to £43.

Now a chargehand process worker at Nylon Works, Wilton, he has cause to value his years underground.

(*Photos: Harold Scott*)



PICTURES FROM OVERSEAS

South Africa. *Mr. H. F. Oppenheimer has been appointed Chairman of the Board of Directors of African Explosives and Chemical Industries in succession to his father, the late Sir Ernest Oppenheimer*

India and Pakistan. *Left, above: The Prime Minister of India, Mr. Nehru, is greeted on his arrival at the annual general meeting in Calcutta of the Associated Chambers of Commerce by Mr. E. Parker, vice-president of the Association and a director of I.C.I. (India) stationed in Bombay. Left, below: Mr. Macmillan greets Mr. Wilkie-Brown, chairman of I.C.I. (Pakistan) during his visit to Karachi. Mr. Wilkie-Brown received the C.B.E. in the New Year Honours List*

Canada. *C.I.L. explosives experts saved the day for Ottawa's old cannon, a veteran of George III's navy, by substituting "squibs"—open caps used for testing blasting machines—in place of obsolete detonating caps. The cannon, which is fired at noon each day, was presented to the newly confederated dominion of Canada by Britain in* 1867

South Africa. *The odds against a cow having triplets are about* 5000 : 1, *but you would have won if you'd bet on Somerset West's Paarde Vlei Devine and Farm Manager Mr. A. Robinson were named Faith, Hope and Charity*

Australia. *Plastics factory manager Mr. Don Currie (right) compares the historic first piece of polythene to be produced in Australia with the ribbon of a production run. The Botany plant, started up last December, has so far cost £2¼ million, and extensions which will run into another million are already under way* (*see story on page* 81)

NEWS IN PICTURES

End of a bridge. *Night work for Nobel Technical Service engineer Mr. David Brook, who supervised the shothole charging and demolition (with Nobel explosives) of a bridge at St. Mary Cray on British Railways Southern Region. Mr. Brook is the man who blew up the bridge in the film "The Bridge on the River Kwai." Below: The old bridge*

Retirement dinner. *Two Winnington 50-year men and their wives—Mr. and Mrs. G. Haddock and Mr. and Mrs. C. Johnson—were among some 300 people who attended the dinner for retiring employees given by the Alkali Division Board*

What's his line? *At the time our photograph was taken David Nixon was appearing as Buttons in the pantomime "Cinderella" at the Manchester Hippodrome. With him in the picture are some of the 1350 children of Dyestuffs Division employees who saw the show*

Hunt scene at Wilton. *An unusual picture for the "Magazine"—but one taken right on I.C.I.'s doorstep—is this picture taken in Wilton Village when the Cleveland hounds met there. There were some thirty riders*

Mr. R. H. Wilkes *retired from Metals Division's Holford Sheet Mill at the age of 65 after 51½ years' service. He joined the Muntz Metal Co. in 1906 as a lodge boy*

Mr. A. R. Thom, *formerly Sales Manager (Paints and Building Materials), Northern Region, has succeeded Mr. N. J. Travis as Managing Director of British Visqueen Ltd.*

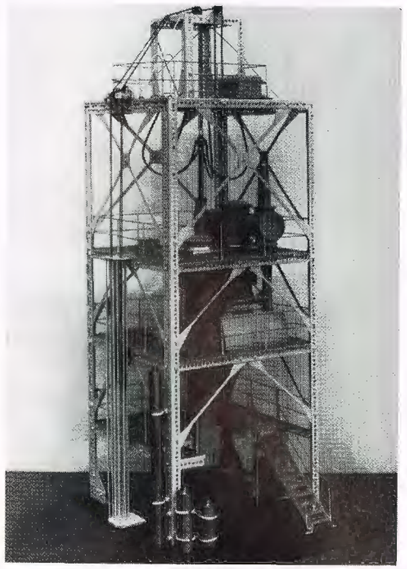
Mr. W. H. Bradley *retired from the Witton Strip Mill in January after 50 years' service. He started work at Kings Norton Factory nickel alloy pot casting and moved to Witton in 1931*

Mr. T. H. Thomason, *Hillhouse Works Safety Officer, has been admitted as a serving brother of the Order of St. John of Jerusalem in recognition of his long service to the cause of first aid. He gained his first St. John certificate as long ago as 1920*

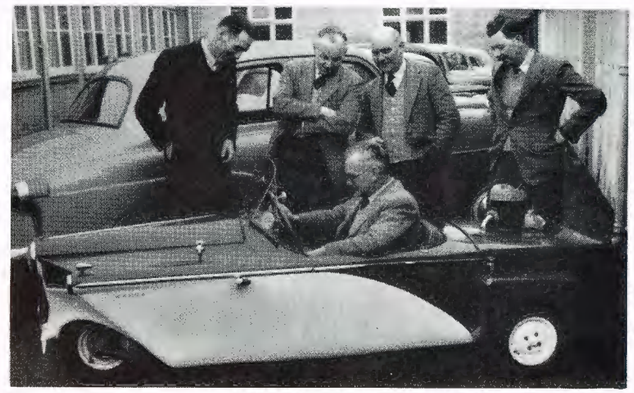
Freeze-up boosts salt sales. *During the big freeze-up mechanical shovels at Winsford Works were loading lorries and rail trucks with ground rock salt for snow clearing, day and night, at the rate of 3 tons per minute for despatch to places as far apart as Kirkcudbright and Falmouth. Above: The entrance to Salt Division headquarters at Vale Royal. Below: A seemingly endless queue of lorries awaiting loading*

Bishop of Chester at Runcorn. *The Bishop of Chester, the Rt. Rev. G. A. Ellison, photographed with Dr. R. N. Kerr (Works Manager) and Mr. H. Shaw (General Chemicals Division Technical Director) during his visit to Castner-Kellner Works and Weston Point Power Station*

Pigeon fanciers. *Still winning prizes for pigeon racing at the age of 82 is Mr. George Hough (left), seen with his brother Tom (84); both are Middlewich pensioners and are among the oldest fanciers in the country*



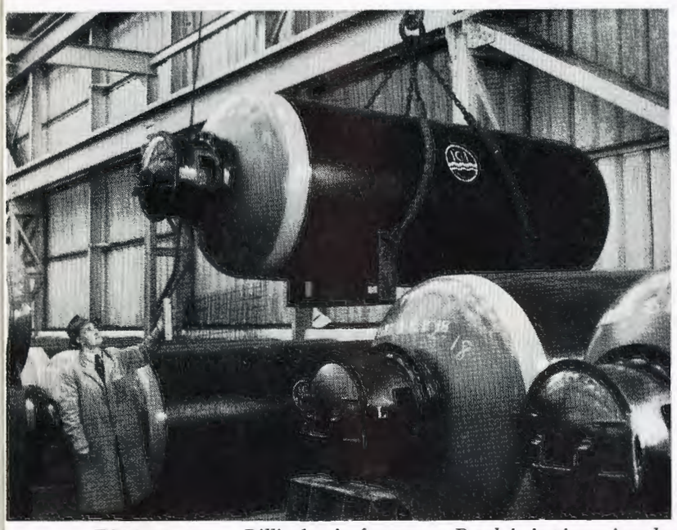
Apprentices' titanium furnace model. *A scale model made in the Apprentice School at Witton of the new type of titanium melting furnace. The model will aid in the construction of the full-scale plant and the training of furnace personnel*



Bowen Special. *Mr. Norman Bowen of Alkali Division Engineering Dept. (in the car) solved his travelling problem by designing and building his own single-seater car. Cost was about £160*

'Terylene' and the fish trade. *Canadian Trade Mission delegates Mr. B. B. Gattie (British Columbia Lumber Manufacturers Association) on the left and Mr. K. F. Fraser of British Columbia Packers Ltd., the largest fish processers in the Commonwealth, inspect this specimen of a 'Terylene' trawl net at a special display staged in Manchester*

Dream dress. *At the international model ball held in London, where Britain's top couturiers were asked to design the dress of their dreams, the Queen's dressmaker Hardy Amies chose 'Terylene'-Lurex brocade for a dramatic black and gold ball dress*



Biggest ever. *Billingham's factory at Dowlais is pioneering the use of the biggest cylinders ever used in I.C.I. for the transport of anhydrous ammonia—they carry eight times as much ammonia as those previously used. The cylinders are among the most travelled pieces of Company equipment—many are sent as far afield as Malaya*

Darby and Joan party. *A New Year party for 500 old age pensioners in the Battersea district was paid for by Head Office staff. Above: Head Office pensioner Mr. Freddy Hanks presents a gift to 71-year-old Mrs. Mutton, whose birthday coincided with the party*

On Top of the World

By Harold Morris

Illustrated by Kenneth Wynn

Here, told in real Lancashire style, is the story that won the holiday article competition—a story of a tall chimney and a £20 bet.

I'm a Lancashire lad. My family consists of my wife, myself and a "panful" of kids. And I do mean a "panful." As I write this story I am dangling my feet in a pool of seawater that the tide has generously left behind, and the wife is being kept busy opening bottles of pop for the kids, whose holiday was earned by the story I am about to relate.

My uncle is a steeplejack. So are my two cousins. It's a family concern. Summoned by letter one day to talk over some decorating, I arrived just as they were sitting down to a slap-up dinner.

After a few handshakes that nearly broke my fingers, my uncle told me that they had just finished laddering a chimney and that after dinner they would climb to the top and view the damage that wind and weather had done to the coping stones. I didn't hesitate to tell my uncle that I would much rather have my present job than risk my neck "on top of the world."

"Bet you twenty pounds you daren't come up with us!" he replied, looking at me.

I laughed and changed the subject. But while I was eating, I was thinking. Twenty quid! What could me and the "panful" do with that! Something to blue. A bit of a change for the wife and plenty of pop and ice cream for the other members of our noisy circus, and a holiday for us all.

Seeing the last piece of juicy steak on its way down to the inner man, I made up my mind there and then. Jumping up rather excitedly, I loudly declared: "Right, Uncle—I'll take you on!"

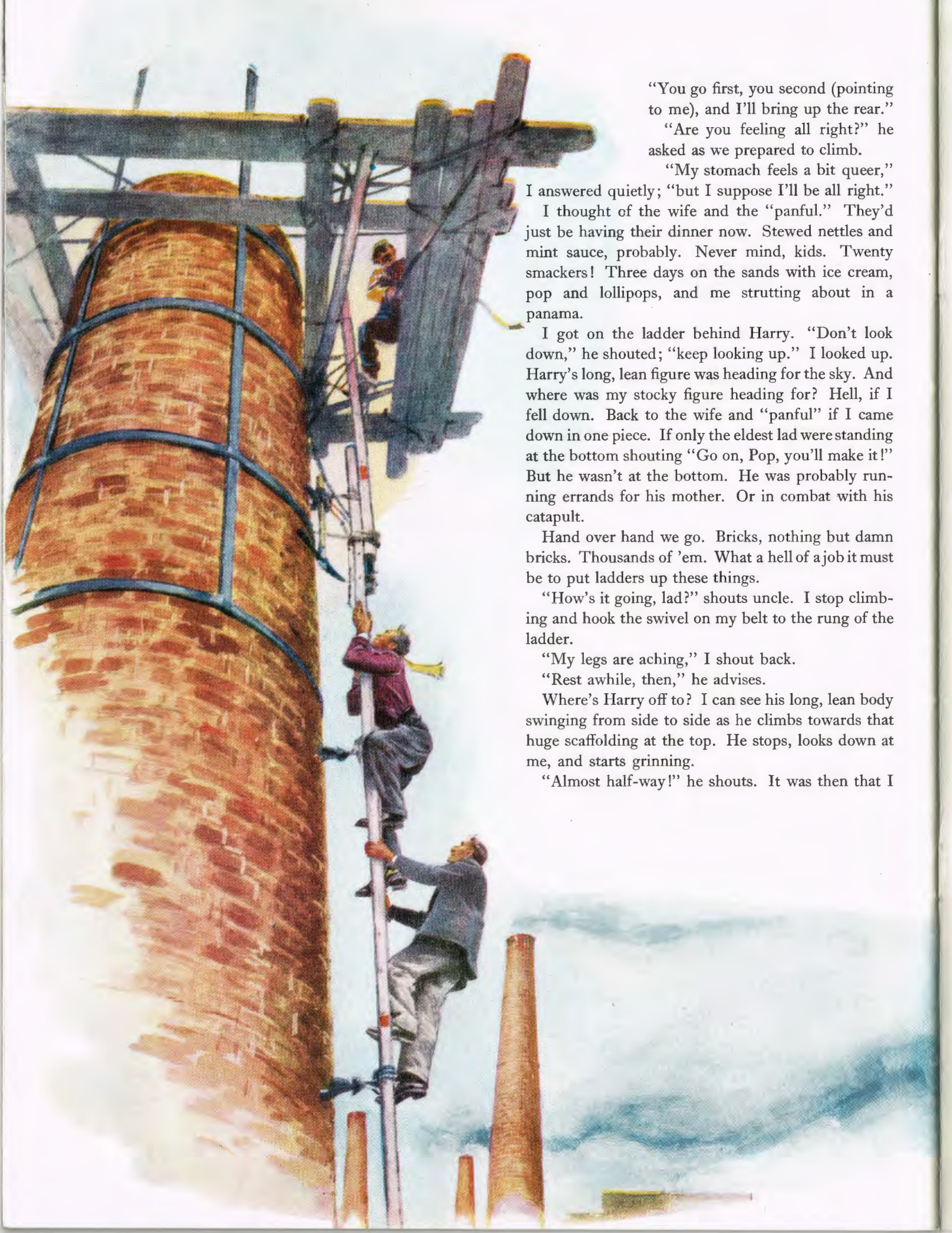
"Find him a pair of overalls, Harry lad," my uncle said to my cousin, "and a leather belt too."

Poor aunt! She looked at me as if I'd just been sentenced to be shot at dawn. Donning the somewhat sooty outfit, I was ready for the climb. All I needed now was nerve and guts. The nerve of my eldest lad and the guts of my youngest. But you can't go around borrowing nerves and guts. I'd have to make do with what the good Lord gave me.

Bidding my aunt goodbye, maybe for the last time, I set out for the chimney. My cousin Harry, who like my uncle had climbed many steeples, was very talkative. As we trudged along he explained how all the big chimneys swayed slightly when a fair wind was blowing. By the time he'd finished telling me all this I began to think that if the damn thing took it into its head to start swaying, it might cost all of that twenty quid to restore my stomach to its natural position.

"There she is!" cried my uncle as we rounded the bend. "Isn't she a beauty!"

Looking magnificent against a background of rolling meadowland and towering up into a clear blue sky, there was something commanding about the old stack. Putting his hand on the brickwork, my uncle fondly patted the old thing. Turning to me, he made the final adjustments to my belt. At the front of it was a huge swivel. Pointing to this, he said quietly: "If you feel tired after climbing about sixty feet, hook the swivel on to the rung of the ladder and you'll be O.K." Turning to his son, he gave the final orders.



"You go first, you second (pointing to me), and I'll bring up the rear."

"Are you feeling all right?" he asked as we prepared to climb.

"My stomach feels a bit queer," I answered quietly; "but I suppose I'll be all right."

I thought of the wife and the "panful." They'd just be having their dinner now. Stewed nettles and mint sauce, probably. Never mind, kids. Twenty smackers! Three days on the sands with ice cream, pop and lollipops, and me strutting about in a panama.

I got on the ladder behind Harry. "Don't look down," he shouted; "keep looking up." I looked up. Harry's long, lean figure was heading for the sky. And where was my stocky figure heading for? Hell, if I fell down. Back to the wife and "panful" if I came down in one piece. If only the eldest lad were standing at the bottom shouting "Go on, Pop, you'll make it!" But he wasn't at the bottom. He was probably running errands for his mother. Or in combat with his catapult.

Hand over hand we go. Bricks, nothing but damn bricks. Thousands of 'em. What a hell of a job it must be to put ladders up these things.

"How's it going, lad?" shouts uncle. I stop climbing and hook the swivel on my belt to the rung of the ladder.

"My legs are aching," I shout back.

"Rest awhile, then," he advises.

Where's Harry off to? I can see his long, lean body swinging from side to side as he climbs towards that huge scaffolding at the top. He stops, looks down at me, and starts grinning.

"Almost half-way!" he shouts. It was then that I made my big mistake. I looked down. I could see something small, probably a bus, moving down below on the road. I felt half-way between heaven and hell, and according to my wife I shall receive a very hearty welcome at the latter.

Sorry, kids! Sorry to disappoint you. I unhook the swivel, but I'm too late. Uncle's coming up. My feet are nearly touching the top of his head.

"Right, boy," he shouts, "off we go!" I look up at Harry. He's away to a good start. That lad has got guts.

Up we go, slow and steady. If "butterflies in the stomach" means that your belly keeps fluttering, then I've got 'em. And I've got 'em bad. What's that noise? It's Harry singing "Come into the garden, Maud." I wish he'd shut up. Believe me, I don't feel like going into any garden with any Maud.

Hell, but my arms are aching! I look up at the scaffolding. It's coming nearer and nearer. We are three parts way up to the top. But it's no use, I must have another rest. My fingers are aching with gripping the sides of the ladder.

"Put your left leg through the space between the staves of the ladder," shouts my uncle encouragingly; "you can rest easily that way." I do as he bade me.

Now Harry is away again. Up he goes, hand over hand. The top part of the chimney looks lonely and uninviting as his long legs carry him onwards and upwards.

"Stick it, boy!" shouts uncle again. "One more climb and we'll be on top of the world." I feel lousy. Dangling there over two hundred feet up, with your left leg hooked inside the stave of a ladder, isn't my idea of a joke. Anybody who makes his living by doing this kind of work deserves all the money he gets, and a lot more besides.

Now I know why most steeplejacks take a drop of short stuff before they go up one of these things.

But I'm no drinking man. I'm teetotal and a non-smoker. And I'm fit—fit to drop right now. I'm not looking down, but I'm looking sideways. And what can I see? Miles and miles of rolling countryside. I think of my boyhood days. Why did I tie that tin can to that cat's tail? Why did I break all those windows? Why in heaven's name did I cause my dear old mother so much worry and trouble?

Hullo, Harry's at the top. He's waving to me. What's he expect me to do—wave back? I'm not going to hang on with one hand just to wave at him. But the lad means well, and it's very encouraging to see him and to know that he's waiting for me up there.

"Well, we can't stop here all day," shouts uncle. So, bringing my legs back on to the ladder, I brace myself for the final part of the climb. I grip the sides, and up I go with dear, faithful old uncle coming up behind.

I can see Harry puffing away at a cigarette and grinning like a Cheshire cat. Yes, that smile of his is doing something to me right now.

And then it happened. Another few yards and I'm at the top. Harry's willing hands are waiting to help my aching legs and arms on to the scaffolding.

I sat on the planks beside Harry. Looking up, there's nothing but clouds and space. Suddenly a head appeared over the ladder, and here comes uncle. He's grinning too.

"Well done, lad!" he said quietly. "And now take a mouthful of this." With trembling hands I took hold of the little bottle, and as the burning liquid went down my throat I knew that I'd be O.K.

"Thanks a lot, Uncle," I said as I returned the bottle. "I needed that, and I needed it badly." Then my uncle began to point out various landmarks and half an hour went swiftly by.

Now it was time to go down. I was ready. I'd been up long enough and I wanted to put my feet on something more solid. The advice was just the same. When once you get on the ladder, keep looking up.

I watched uncle go first. Harry's big strong arms helped me on to the ladder and I was on my way down. This time uncle started singing at the top of his voice. I dare say he was glad it was all over. Was I singing? Well, hardly, but I was talking to myself.

Down we go, and the top of the chimney goes further and further away. I can see other chimneys now, but they are little friendly ones on the rooftops. Nearly at the bottom now. I jump the last two yards, and this is it. I've made it!

Uncle gripped my hand and asked me how I would like to be a steeplejack.

"Let me get back to my job with I.C.I." I replied, grinning. And I thought of telling him what he could do with chimneys.

When we arrived back, my aunt looked rather pale. Uncle didn't hesitate to pay up, and after a nice cup of tea I was very soon in the bus on my way home. As I looked through the window I could see the old chimney in the distance. Lonely, forlorn, yet proud and commanding, with her nose pointing to the sky. "Never again, old girl," I muttered. "Never again!"

"Transporter Bridge"

Photo by R. Green (Billingham Division)